Does Solar Radiation Affect the Growth of Tomato Seeds Relative to their Environment?

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Introduction

Have you every thought that you might have the opportunity to send something up in to space? Receiving an opportunity like this has been a great experience for me. Recently I send tomato seeds up into space to see whether radiation affected the growth of the tomato seeds. I also wanted to see whether the tomato seeds will produce any fruit.

Purpose

The purpose of this experiment is to sequentially study and analyze the data collected from the germination and growth of irradiated Rutgers Supreme tomato seeds to adult producing plants. This experiment will not use irradiated seeds as a control as I plan to note growth in artificial verses natural environment as the basic experiment.

Procedure

Sequence is defined and divided into three phases. First as the process of germination, transplanting, and noting growth until the Regional ISEF on March 21, 1995. Secondly, when appropriate, selected seedlings will be transplanted to an outdoor garden allowing for natural growth within our regional climate for data collection. Third, to remove some selected plants prior to fall to an artificial indoors setting to continue the growth process and collect data.

In phase one, I will use an active control and experimental group of seeds (same flight, different package lot number) with the same approximate package date. Laboratory conditions will be such to afford the same for both groups to simulate a natural setting. I have considered the actual age of the seeds, being packaged and sent in the Shuttle Columbia on January 1990 as a possible problem to germination rate, but equal to all seeds used for experimentation. Phase one and two will employ growth after germination. This is outlined in the following paragraphs.

Phase two notes the movement of plants to an outdoors harden and creates the necessity of new data collection methods. This researcher will stop height measurements after the first table ripe tomato is removed and shall then begin to weigh and count all ripe tomatoes produced by each individual plant. Unripe tomatoes will be added to data at time of the plants' death. This outdoors method will assume all of natures activities will be equal as well as artificial methods of watering and fertilizing. This method will allow for control verses experimental group comparisons with some plants remaining indoors.

For all but six preselected plants data collection will conclude when plants die as a result of natural activities of the climate.

Phase three is to collect the preselected plants prior to frost relative to their natural death and reinstall them into an indoor artificial climate. This process will allow the continued collection of plant growth data. I will proceed with this last step until the plants die or no longer produce tomatoes.

Hypothesis

Through this experiment I expect to prove that there will be significant adverse effects of solar radiation on the plant germination and growth.

Conclusions

I have made the following conclusions, that the germination rate and germination time were not normal. The tomato seeds that went into space seemed to germinate faster than the regular seeds or the control group. The growth rate was normal, with the exception of Group B, which appeared to be slow in development. The germination time was half that of the common seeds.

Results

The germination rate was 100%. Germination time was half that of the common seeds. The plant growth appeared to be normal except for Group B which appeared to be slow in development.

As of July 5, 1995, I have no recent results because on July 3, 1995 at 4:30 p.m. a thunderstorm that produced hail destroyed my tomato plants. The plants had just begun to have blossoms on the leaves.

At the present time I am unaware of the possible results but will attempt through the above steps to determine the growth effects of artificial verses natural environment using irradiation Rutgers Supreme tomato seeds.

Bibliography

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